REMARKS

Claims 6-9, 15-20, 22-24, 26-29, 31-33, 35, 64, 66-68,70-76, and 79 remain pending for consideration. The Office Action rejected Claim 63 under 35 U.S.C. § 112, first and second paragraphs. The Office Action rejected Claims 6-9, 16 and 79 as under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,273,108 to Bergman et al. (the "Bergman patent") in view of and U.S. Patent No. 6,124,158 to Dautartas et al. ("the Dautartas patent"). The Office Action rejected Claim 15 under 35 U.S.C. § 103(a) as being unpatentable over the Bergman patent in view of and U.S. Patent No. 5,598,316 to Kasting, Jr. et al. ("the Kasting patent"). The Office Action rejected Claims 17-20, and 27-29 under 35 U.S.C. § 103(a) as being unpatentable over the Bergman patent in view of the Boley patent. The Office Action rejected Claims 22-24, 26, 31-33 and 35 under 35 U.S.C. § 103(a) as being unpatentable over the Bergman patent in view of the Boley patent and further in view of the Dautartas patent. The Office Action rejected Claims 63, 64, 66-68 and 70-76 under 35 U.S.C. § 103(a) as being unpatentable over the Dautartus patent in view of the Bergman patent.

REJECTION OF CLAIM 63 UNDER 35 U.S.C. § 112

The Office Action rejected Claim 63 under 35 U.S.C. § 112, first and second paragraphs. Although Applicant believes Claim 63 to be correct, Claim 63 has been clarified. These claim clarifications are not made for patentability purposes, and it is believed that the claims would satisfy the statutory requirements for patentability without the entry of such clarifications. Withdrawal of the rejection of Claim 63 is requested.

REJECTION OF CLAIMS 6-9, 16 AND 79 UNDER 35 U.S.C. § 103(a)

The Office Action also rejected Claims 6-9, 16 and 79 as under 35 U.S.C. § 103(a) as being unpatentable over the Bergman patent in view of and the Dautartas patent.

Claim 6

Claim 6 is directed to an ozone shower system, comprising: an ozone source configured to supply ozone to a process chamber; at least one semiconductor workpiece positioned within a cassette, the cassette having a top and a bottom; at least two rotating axles within the process chamber, the two rotating axles positioned to support the semiconductor workpiece in a manner that creates a gap between the semiconductor workpiece and the bottom of the cassette so that the cassette can remain stationary while

the rotating axles rotate the semiconductor workpiece; a sprayer positioned above the top of the cassette, the sprayer connected to a fluid source such that fluid sprays over the semiconductor workpieces in the process chamber; a pump connected to a fluid source; and a selector valve connected to the pump, the selector valve configured to selectively pulse the fluid through the sprayer.

In contrast, the Bergman patent does not disclose the concept of selectively pulsing the fluid with a selector valve. Furthermore, the Bergman patent dies not disclose at least two rotating axles positioned to support the semiconductor workpiece in a manner that creates a gap between the semiconductor workpiece and the bottom of the cassette so that the cassette can remain stationary while the rotating axles rotate the semiconductor workpiece.

Rather, the Bergman patents appears to describe supports 25 that rotate about a single axis. The supports 25 also do not appear to create a gap between the semiconductor workpiece and the bottom of the cassette. The supports 25 also appear to interfere with the fluid sprayed by the sprayers 40.

The Dautartus patent also does not appear to describe two rotating axles positioned to support the semiconductor workpiece in a manner that creates a gap between the semiconductor workpiece and the bottom of the cassette so that the cassette can remain stationary while the rotating axles rotate the semiconductor workpiece.

In brief, none of the references either alone, or in combination, teach the concept of pulsing a fluid or use of two rotating axles positioned to support the semiconductor workpiece in a manner that creates a gap between the semiconductor workpiece and the bottom of the cassette so that the cassette can remain stationary while the rotating axles rotate the semiconductor workpiece.

Applicant therefore respectfully submits that Claim 6 is patentably distinguished over the cited references and Applicant respectfully requests allowance of Claim 6.

Claims 7-9

Claims 7-9 which depend from Claim 6, are believed to be patentable for the same reasons articulated above with respect to Claim 6, and because of the additional features recited therein.

Claim 16

Claim 16 is directed to a reaction chamber which removes a portion of a semiconductor workpiece by applying an intermittent fluid to the portion during removal, the reaction chamber comprising: at least one nozzle connected to a fluid supply and configured to pulse fluid onto a semiconductor workpiece; and a rotator capable of rotating the semiconductor workpiece during a removal of a portion of the semiconductor workpiece at a velocity not exceeding 100 revolutions per minute (RPM), wherein the semiconductor workpiece is located between the sprayer and the rotator.

In contrast, the Bergman patent does not disclose the concept of a valve that pulses fluid. Furthermore, the Bergman patent does not disclose a rotator wherein the semiconductor workpiece is located between the sprayer and the rotator. Instead, the Berman patent appears to disclose the use of supports 25 that interfere with the fluid sprayed by the sprayers 40.

The Dautartus patent also does not appear to describe a rotator wherein the semiconductor workpiece is located between the sprayer and the rotator. In brief, none of the references either alone, or in combination, teach the elements of Claim 16.

Applicant therefore respectfully submits that Claim 16 is patentably distinguished over the cited references and Applicant respectfully requests allowance of Claim 16.

Claim 79

Claim 79 which depends from Claim 16, is believed to be patentable for the same reasons articulated above with respect to Claim 16, and because of the additional features recited therein.

REJECTION OF CLAIM 15 UNDER 35 U.S.C. § 103(a)

The Office Action also rejected Claim 15 under 35 U.S.C. § 103(a) as being unpatentable over the Bergman patent in view of the Kasting patent.

Claim 15 is directed to a reaction chamber comprising: a gas input; a plurality of nozzles connected to a nozzle manifold; a wafer cartridge holding wafers; at least two rotating axles within the process chamber, the two rotating axles positioned to support and rotate the wafers; a first fluid line supplying fluid to the nozzle manifold; and a second fluid line capable of diverting the fluid away from the first fluid line.

In contrast, the Bergman patent does not disclose at least two rotating axles within the process chamber, the two rotating axles positioned to support and rotate the wafers. The Kasting patent also does not appear to describe at least two rotating axles within the process chamber, the two rotating axles positioned to support and rotate the wafers. In brief, none of the references either alone, or in combination, teach the elements of Claim 15.

Applicant therefore respectfully submits that Claim 15 is patentably distinguished over the cited references and Applicant respectfully requests allowance of Claim 15.

REJECTION OF CLAIMS 17-20 AND 27-29 UNDER 35 U.S.C. § 103(a)

The Office Action further rejected Claims 17-20 and 27-29 under 35 U.S.C. § 103(a) as being unpatentable over the Bergman patent in view of the Boley patent.

Claim 17

Claim 17 is directed to an apparatus comprising: at least one wafer processing chamber wherein an ozone rich environment exists within the wafer-processing chamber; a rotator that creates a gap between a wafer and a wafer cassette, wherein the rotator rotates the wafer while allowing the cassette to remain substantially stationary; a sprayer; and a pulsating fluid source, the pulsating fluid source configured to pulse a solution through the sprayer into the ozone rich environment.

In contrast, the Bergman patent does not disclose a pulsating fluid source or a rotator that rotates a wafer while allowing the cassette to remain substantially stationary. The Boley patent also does not appear to describe a pulsating fluid source or a rotator that rotates a wafer while allowing the cassette to remain substantially stationary. In brief, none of the references either alone, or in combination, teach the elements of Claim 17.

Applicant therefore respectfully submits that Claim 17 is patentably distinguished over the cited references and Applicant respectfully requests allowance of Claim 17.

Claims 18-20

Claims 18-20 which depend from Claim 17, are believed to be patentable for the same reasons articulated above with respect to Claim 17, and because of the additional features recited therein.

Claim 27

Claim 27 is directed to an apparatus comprising: at least one semiconductor processing chamber; a rotator that creates a gap between a wafer and a wafer cassette, wherein the rotator rotates the wafer; and a pulsating fluid source, the pulsating fluid source configured to pulse an ozone-rich solution into the semiconductor-processing chamber.

In contrast, the Bergman patent does not disclose a pulsating fluid source or a rotator that creates a gap between a wafer and a wafer cassette. The Boley patent also does not appear to describe a pulsating fluid source or a rotator that creates a gap between a wafer and a wafer cassette. In brief, none of the references either alone, or in combination, teach the elements of Claim 27.

Applicant therefore respectfully submits that Claim 27 is patentably distinguished over the cited references and Applicant respectfully requests allowance of Claim 17.

Claims 28 and 29

Claims 28 and 29 which depend from Claim 27, are believed to be patentable for the same reasons articulated above with respect to Claim 27, and because of the additional features recited therein.

REJECTION OF CLAIMS 22-24, 26, 31-33 AND 35 UNDER 35 U.S.C. § 103(a)

The Office Action further rejected Claims 22-24, 26, 31-33 and 35 under 35 U.S.C. § 103(a) as being unpatentable over the Bergman patent in view of the Boley patent and further in view of the Dautartas patent.

Claims 22-24 and 26 which depend from Claim 17, are believed to be patentable for the same reasons articulated above with respect to Claim 17, and because of the additional features recited therein.

Claims 31-33 and 35 which depend from Claim 27, are believed to be patentable for the same reasons articulated above with respect to Claim 27, and because of the additional features recited therein.

REJECTION OF CLAIMS 63, 64, 66-68 and 70-76 UNDER 35 U.S.C. § 103(a)

The Office Action rejected Claims 63, 64, 66-68 and 70-76 under 35 U.S.C. § 103(a) as being unpatentable over the Dautartus patent in view of the Bergman patent.

Claim 63

Claim 63 is directed to an apparatus for removing a portion of a semiconductor workpiece, the apparatus comprising: a fluid source configured to vary a fluid from a greater flow to a lesser flow, wherein a duty cycle of the varying fluid comprises an amount of time the fluid flows at the greater flow versus an amount of time the fluid flows at the lesser flow plus the amount of time the fluid flows at the greater flow; one or more nozzles capable of spraying the varying fluid over a semiconductor workpiece; and at least one rotator configured to at least partially separate the semiconductor workpiece from a carrier, the rotator further configured to rotate the semiconductor workpiece at one or more speeds to, in conjunction with one or more duty cycles of the varying fluid, to control a thickness of a boundary layer of the varying fluid on the workpiece, wherein varying the thickness of the boundary layer varies an amount of ozone that is transferred to the workpiece and wherein the ozone and the varying fluid enhance the removal of a portion of the workpiece.

In contrast, the Dautartus patent does not disclose a rotator configured to at least partially separate the semiconductor workpiece from a carrier. The Dautartus patent also does not disclose rotating the semiconductor workpiece at one or more speeds to, in conjunction with one or more duty cycles of the varying fluid, to control a thickness of a boundary layer of the varying fluid on the workpiece.

The Bergman patent also does not appear to disclose a rotator configured to at least partially separate the semiconductor workpiece from a carrier. In brief, none of the references either alone, or in combination, teach the elements of Claim 63.

Applicant therefore respectfully submits that Claim 63 is patentably distinguished over the cited references and Applicant respectfully requests allowance of Claim 63.

Claims 64, 66-68 and 70-76

Claims 64, 66-68 and 70-76 which depend from Claim 63, are believed to be patentable for the same reasons articulated above with respect to Claim 63, and because of the additional features recited therein.

CONCLUSION

In view of the forgoing, the present application is believed to be in condition for allowance and the Applicants respectfully requested the same. If further issues remain to be resolved, the Examiner is cordially invited to contact the undersigned. Also, please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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Dated: 7/3/03

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